What is Claimed:

1. A method for synthesizing pentostatin, a pentostatin analog, a pentostatin aglycone, or a pentostatin aglycone analog which method comprises the steps of:

converting a dialkyl tartarate to a succinonitrile derivative;

reacting the succinonitrile derivative with an amine to form a substituted imidazole compound, wherein the substituted imidazole compound comprises a moiety having a cyano group;

reducing the cyano group on the substituted imidazole to a primary amino group; and

cyclizing the primary amino group with a second amino group on the substituted imidazole compound to obtain pentostatin, a pentostatin analog, a pentostatin aglycone, or a pentostatin aglycone analog.

2. The method of claim 1, wherein the dialkyl tartarate is in either the L or D enantiomeric form.

3. The method of claim 2, wherein the dialkyl tartarate is L-Diethyl tartarate.

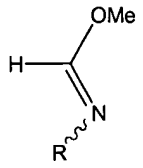
4. The method of claim 2, wherein the dialkyl tartarate is D-Diethyl tartarate.

5. The method of claim 1, wherein the amine is ammonia or a primary amine.

6. The method of claim 5, wherein the amine has the formula $R\text{-}NH_2$, wherein R is a Hydrogen, a substituted or unsubstituted alkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkoxyalkyl group, or a substituted or unsubstituted heteroaryl group.

7. The method of claim 1, wherein the amine is benzyl amine, allyl amine, beta-cyanoethyl amine, or p-methoxy benzyl amine.

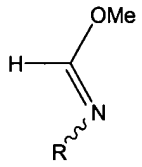
8. The method of claim 1, wherein the amine has the formula



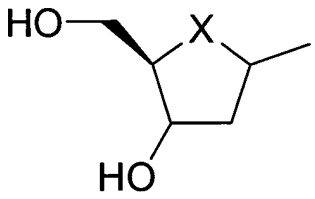
wherein R is deoxyribose, ribose, arabinose, xylose, ribose, lyxose, glucose, galactose, mannose, gulose, idose, talose, altrose, allose, fructose, sorbose, or tagatose.

9. The method of claim 8, wherein R is deoxyribose, the dialkyl tartarate is L-diethyl tartarate, and pentostatin is synthesized.

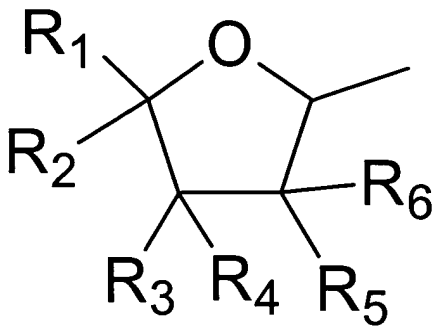
10. The method of claim 1, wherein the amine has the formula



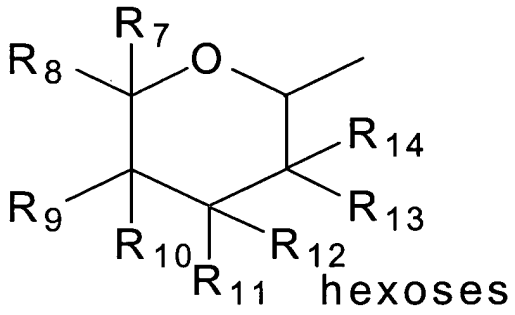
wherein R is



wherein X is O, S, NH, or CH_2; or



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are independently selected from OH, H, methyl, alkyl, CH_2OH, a halogen, a substituted or unsubstituted O-R group, a substituted or unsubstituted S-R group, or a NRR group, wherein R is a straight-chained or substituted alkyl or alkenyl group;



wherein R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, and R_{14} are independently selected from OH, H, methyl, alkyl, CH_2OH, a halogen, a substituted or unsubstituted O-R group, a substituted or unsubstituted S-R group, or a NRR group, wherein R is a straight-chained or substituted alkyl or alkenyl group.

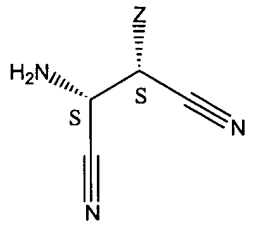
11. The method of claim 1, wherein the cyclization is performed with an orthoformate.

12. The method of claim 11, wherein the orthoformate has the formula $HC(OR)_3$, wherein R is a straight-chained or substituted alkyl group.

13. The method of claim 1, further comprising the step of glycosylating the pentostatin aglycone or the pentostatin aglycone analog.

14. The method of claim 13, wherein the pentostatin aglycone is glycosylated with deoxyribose to obtain pentostatin.

15. The method of claim 1, wherein the succinonitrile derivative has the formula:



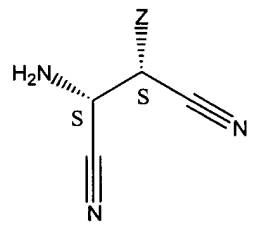
wherein Z is OR, wherein R is a protecting group.

16. The method of claim 15, wherein Z is OTBDMS, $OSiPh_2C(CH_3)_3$, an acetyl group, a DMT-derivative, or Methylthioethyl amine.

17. The method of claim 1, wherein the primary amino group comprises a protecting group, and the protecting group is removed after cyclization.

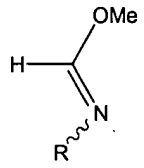
18. A method for synthesizing pentostatin or a pentostatin analog, which method comprises the steps of :

converting a L diethyl tartrate to a succinonitrile intermediate, the intermediate having the formula:

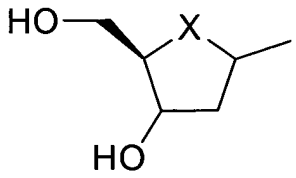


wherein Z is OR, wherein R is a protecting group;

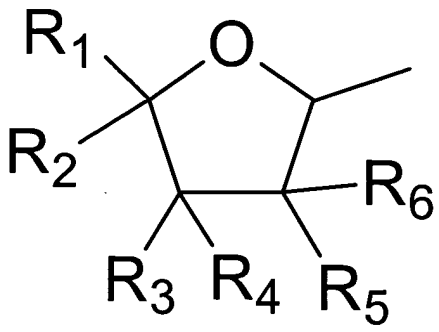
reacting the succinonitrile intermediate with an amino sugar intermediate having the formula:



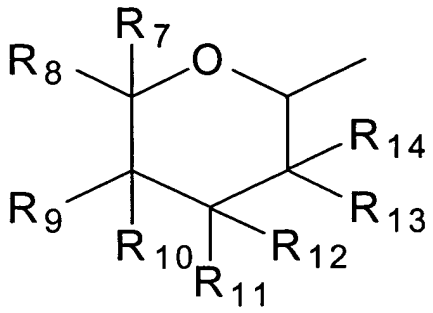
wherein R is



wherein X is O, S, NH, or CH_2; or



wherein R_1, R_2, R_3, R_4, R_5, and R_6 are independently selected from OH, H, methyl, alkyl, CH_2OH, or a halogen; or



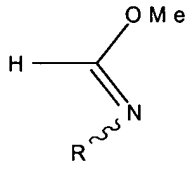
wherein R_7, R_8, R_9, R_{10}, R_{11}, R_{12}, R_{13}, and R_{14} are independently selected from OH, H, methyl, alkyl, CH_2OH, or a halogen, wherein the substituted imidazole compound comprises a moiety having a cyano group;

reducing the cyano group on the substituted imidazole to a primary amino group; and

adding a orthoformate to cyclize the primary amino group with a second amino group on the substituted imidazole compound; and

removing the protecting group to obtain pentostatin or the pentostatin analog.

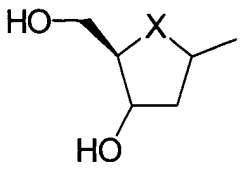
19. The method of claim 18, wherein the amino sugar intermediate has the formula



wherein R is deoxyribose, ribose, arabinose, xylose, ribose, lyxose, glucose, galactose, mannose, gulose, idose, talose, altrose, allose, fructose, sorbose, or tagatose, to form a substituted imidazole compound.

20. The method of claim 19, wherein R is deoxyribose.

21. The method of claim 18 wherein R is



wherein X is S, NH, or CH_2.